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ABSTRACT

This paper describes studies conducted in Saudi Arabia that: (1) investigated the effect of the number of orthographic alternatives of English consonant sounds on the spelling responses of 48 first-year secondary students studying English as a foreign language (EFL); and (2) compared the use of two spelling mechanisms of these first-year secondary students with that of 90 first-year interemdiate school students, representing pre-intermediate and beginning levels of proficiency, respectively. Data for the younger group were obtained in an earlier study. The test used consisted of 37 Arabic words for which students were to supply the English words, and included 50 orthographic representations of 22 English consonant sounds. In the first study, the more advanced group was found to have significantly more correct spelling. For the second study, two spelling mechanisms were distinguished, including sound-to-print and selection. While the two mechanisms appeared to be used more efficiently by the secondary students, patterns were similar in the two proficiency groups. Further research comparing spelling behavior at these and higher proficiency levels and in the native and second language is recommended. (MSE)

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COMPARING SPELLING MECHANISMS OF BEGINNING AND PRE_INTERMEDIATE EFL STUDENTS

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Difficulty of English spelling is generally attributed to the inconsistency of the English spelling system. As a result, English spelling is "often derided as illogical and arbitrary"(Frith,1980,Preface). Hall (1971) classifies English spellings into three main types, the regular, the semi-regular (i.e., irregularities that fall into certain sub-sets which are consistent within themselves), and the downright irregular (pp.45-46).

In order to handle these types of spelling successfully, Jorm(1983) suggests that a good speller should have two mechanisms: 1) a sound-to-print mechanism (for applying sound-to-print rules), and 2) a selection mechanism (for selecting the appropriate graphemes to represent each sound (pp.96-98). If either, or both, of these two mechanisms are not working properly, spelling errors are produced.

Spelling mistakes are classified by Jorm (1983) as phonetically accurate errors or phonetically inaccurate errors. Phonetically accurate errors reflect the successful use of sound-to-print rules, but the selection of inappropriate letters to represent the sounds of a word. On the other hand, phonetically

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inaccurate errors imply that the sound-to-print rules are not used correctly (pp. 99-101).

One aspect of the inconsistency of English spelling is that "most sounds can plausibly be represented several different ways in print"(Jorm, 1983, p. 97). In a previous study of the effect of the number of alternate orthographic representations of English consonant sounds on the spelling mechanisms of beginning EFL students, Badr (1989) found that the sound-to-print mechanism was not affected by the number of orthographic alternates of English sounds. However, the efficiency of the selection mechanism seemed to be inversely proportional to the number of alternates.

The aim of this present study is to compare the behaviour of the two spelling mechanisms in two different levels of language ability (beginning and pre-intermediate).

PROBLEM

The problem of this study is two-fold:

1. To investigate the effect of the number of orthographic alternates of English consonant sounds on the spelling responses of 1st year secondary school students who study English as a foreign language.
2. To compare the behaviour of the two spelling mechanisms of 1st year secondary school students (obtained by this study) with the behaviour of these mechanisms among 1st year intermediate school students as obtained in a previous study (Badr, 1989). These two groups were taken to represent two different levels of EFL ability: pre-intermediate and beginning respectively.

METHOD

Subjects:

The subjects for this study consisted of 48 first year students enrolled in two classes selected randomly from a secondary school for boys in Abha, Saudi Arabia (N=27+21). These students were between 16-17 years and were studying in the middle of the first term. They had studied English for three years in the intermediate school (4 class periods per week). In the secondary school, they were also assigned four class periods per week to cover their textbook 'Saudi Arabian Schools' English, Secondary First Grade'(1987). Students at that level are generally classified as pre-intermediate EFL students.

The subjects for the previous study(Badr, 1989) consisted of 90 intermediate first grade students in the same province. Those students who were between 12-14 years, had studied English for one year (4 class periods per week) and they were preparing for the final test. Those students were taken to represent the beginning level in EFL.

Procedures:

Since the aim was partly to compare the results of this study with those obtained in the previous one (Badr, 1989), students were given the same spelling test that had been used in the other study. It consisted of 37 Arabic words, and testees were required to supply the English word for each. The test was designed to include 50 orthographic representations of the 22 English consonant sounds. Those representations were based on an analysis of 'Saudi Arabian Schools' English, Intermediate First Grade (1986) since the test was developed originally for 1st year intermediate students. Therefore, any orthographic representations that students had not been exposed to were excluded from the test. (See Appendix A for the test, and Appendix B for a list of the 22 consonants together with the orthographic representations tested).

This translation technique was preferred to other techniques for testing spelling. Dictation was excluded on

the basis that students might be affected by the speaker's pronunciation, thus putting down words which were not part of their vocabulary. This would result in more errors of the phonetically accurate type. The multiple-choice technique wan not used since it has been found that the selection task and the supply-type task elicit different responses in spelling (Badr, 1987).

The procedures of test administration were the same as in the previous study. The spelling test was administered to each class separately around the middle of the first term of the school year 1988-1989. No time limit was set for the test, and all students submitted their papers in less than 30 minutes.

RESULTS

The 22 English consonant sounds under study were classified into five categories on the basis of the number of alternative orthographic representations of each sound:

Category 1. Sounds with one orthographic representation: /b/, /θ/, /ʃ/, /h/, /ž/.

Category 2. Sounds with two orthographic alternates: /p/, /t/, /d/, /g/, /l/, /r/, /m/, /n/, /v/, /ŋ/.

Category 3. Sounds with three orthographic alternates: /z/, /f/, /č/, /ǰ/.

Category 4. Sounds with four orthographic alternates: /s/, /š/.

Category 5. Sounds with five orthographic alternates: /k/.

Students' spelling responses were divided into three types: correct spelling, phonetically accurate errors, and phonetically inaccurate errors. Missing responses were taken to mean that such words were not part of students' vocabulary. Students' responses (words) which were different from the target ones, whether synonyms or wrong words, were excluded. The three types of students' spelling responses were obtained for each of the 50 orthographic representations (Appendixes B & C).

The data obtained are presented here in two main sections: a) Comparing the types of responses in the two language levels, b) Comparing the behaviour of spelling mechanisms in the two language levels.

Section 1. Comparing Spelling Responses in the Two Groups:

To compare the results obtained by first year secondary and first year intermediate school students the percentages of the three types of responses were obtained for the five categories of consonant sounds. Table 1 shows the percentages achieved by the two groups:

Table 1. Percentages Achieved by the Two Groups on the Three Types of Responses in the Five Categories.

	Intermediate School			Secondary School		
Category	Correct %	Phon. Accur. Errors %	Phon. Inacc. Errors %	Correct %	Phon. Accur. Errors %	Phon. Inacc. Errors %
1	74.1	---	25.9	90.3	---	9.7
2	74	20.3	5.7	90.2	8.3	1.5
3	61.2	22.5	16.3	83.8	9.4	6.8
4	56.7	33.6	9.7	83.8	15	1.2
5	47.5	50.8	1.7	78.2	20.9	.9
Total	65.6	24.3	10.1	86.4	10.2	3.4

Table (1) shows the following:

A. Correct Spelling Responses:

First year secondary students achieved higher percentages than first year intermediate school students on each of the five sound categories as well as on the total correct responses. The two groups were similar in that category 1 had the highest percentage and category 5 achieved

the lowest. Although the order of categories in the intermediate school group was : 1 (highest), 2, 3, 4, 5 (lowest), categories 3 and 4 had the same percentage in the secondary school group. Another similarity was that the difference between category 1 and category 2 was so slight (.1%) in the two groups.

On the other hand, the t-test was used to find if there were significant differences between the two groups in the correct spelling responses. Table 2 was obtained.

Table 2. The t-test for the Mean Differences between the Two Groups in Correct Spelling

Group	N	Mean	S.D.	t
Secondary School Group	48	18.67	9.85	25.64
Intermediate School Group	90	5.47	6.92	

The t-test shows that there were highly significant differences for the secondary school group over the intermediate school group at .01 confidence level.

B. Phonetically Accurate Errors:

The percentages achieved by the secondary school group were lower than the intermediate school group on each of the five sound categories as well as on the total phonetically accurate errors. The two groups, however, were similar in the order of categories: 1 (lowest), 2, 3, 4, 5 (highest).

But, since category 1 has, by definition, only one possible orthographic representation, it should be excluded on the basis that it does not allow any phonetically accurate errors.

C. Phonetically Inaccurate Errors:

The secondary school group achieved lower percentages than the intermediate school group on each of the five sound categories as well as on the total phonetically inaccurate errors. The order of categories in the two groups is different:

Secondary School: 1 (highest), 3, 4, 2, 5 (lowest).

Intermediate School: 1 (highest), 3, 2, 4, 5 (lowest).

The order of categories in the two groups does not show consistent relationship between the number of orthographic alternates and the phonetically inaccurate errors made by students.

Section 2. Comparing Spelling Mechanisms:

This study intended to compare the behaviour of the two spelling mechanisms in the intermediate and secondary school groups: sound-to-print mechanism and selection mechanism. This was done by studying students' application of sound-to-print rules and selection rules in the five categories of orthographic representation.

A. Sound-to-Print Rules:

Since both correct spelling responses and phonetically accurate errors would reflect students' ability to apply the sound-to-print rules successfully, the first two columns of table (1) were added and the percentages were obtained for the total phonetically accurate responses (correct and errors). Table (3) was obtained for the percentages achieved by the two groups of students:

Table 3. Percentages of Total Phonetically Accurate Responses in the Five Categories by the Two Groups.

Category	Intermediate Group %	Secondary Group %
1	74.1	90.3
2	94.3	98.5
3	83.7	93.2
4	90.3	98.8
5	98.3	99.1
Total	89.9	96.6

Table (3) shows the following:

1) The secondary school group achieved higher percentages than the intermediate school group on the total phonetically accurate responses as well as on each of the five categories of orthographic representation.

2) The order obtained for the five categories was:

intermediate school: 1 (lowest), 3, 4, 2, 5 (highest).

Secondary school: 1 (lowest), 3, 2, 4, 5((highest).

The order in the two groups is not the same. Both groups, however, have one thing in common: the order does not show consistent relationship between the number of orthographic alternates and the phonetically accurate responses.

B. Selection Rules:

To compare the behaviour of the selection mechanism in the two groups, the percentages of the correct spelling responses (column 1, table 1) were obtained against the total phonetically accurate responses: correct and errors (columns 1&2, table 1). Table (4) shows the percentages obtained by the two groups.

Table 4. Percentages of Correct Responses as Against the Total Phonetically Accurate Responses in the Five Categories (Two Groups).

Category	Intermediate Students		Secondary Students	
	Correct	Total Phonet. Acc. Responses	Correct	Total Phonet. Acc. Responses
1	172 100%	172 100%	176 100%	176 100%
2	849 78.5%	1082 100%	790 91.5%	863 100%
3	402 73.1%	550 100%	419 89.9%	466 100%
4	204 62.8%	325 100%	284 84.8%	335 100%
5	142 48.3%	294 100%	168 78.9%	213 100%
Total	1769 73%	2423 100%	1837 89.5%	2053 100%

Table (4) shows the following:

1) The secondary school group achieved higher percentages than the intermediate school group in the ability to select the appropriate graphemes on each category as well as on the total of five categories.

2) The order of the five categories was the same in the two groups:

1 (highest), 2, 3, 4, 5 (lowest).

3) This order indicated consistent negative relationship between the number of alternates and students' ability to select the appropriate graphemes.

DISCUSSION

1. Comparing the Three Types of Responses in the Two Groups.

A. Correct Spelling:

The t-test showed that there were highly significant differences for first year secondary students over first year intermediate students on the total correct spelling responses. Secondary school students also achieved higher percentages than intermediate school students on each of the five categories as well as on the total of five categories. This may indicate that the general spelling ability of students has improved as a result of spending more years studying English.

However, responses of the two groups of students showed two similar characteristics:

a) The order of the five categories of orthographic representation in the two groups was the same except that categories 3 and 4 had the same percentage in the secondary school group. This order was:

1 (highest), 2, 3, 4, 5 (lowest).

b) The difference between category 1 and category 2 was so slight in the two groups (.1%).

It seems that the effect of the number of orthographic alternates on the general spelling ability was similar in the two groups. Chart 1 compares the percentages of correct responses achieved by the two groups in the five categories.

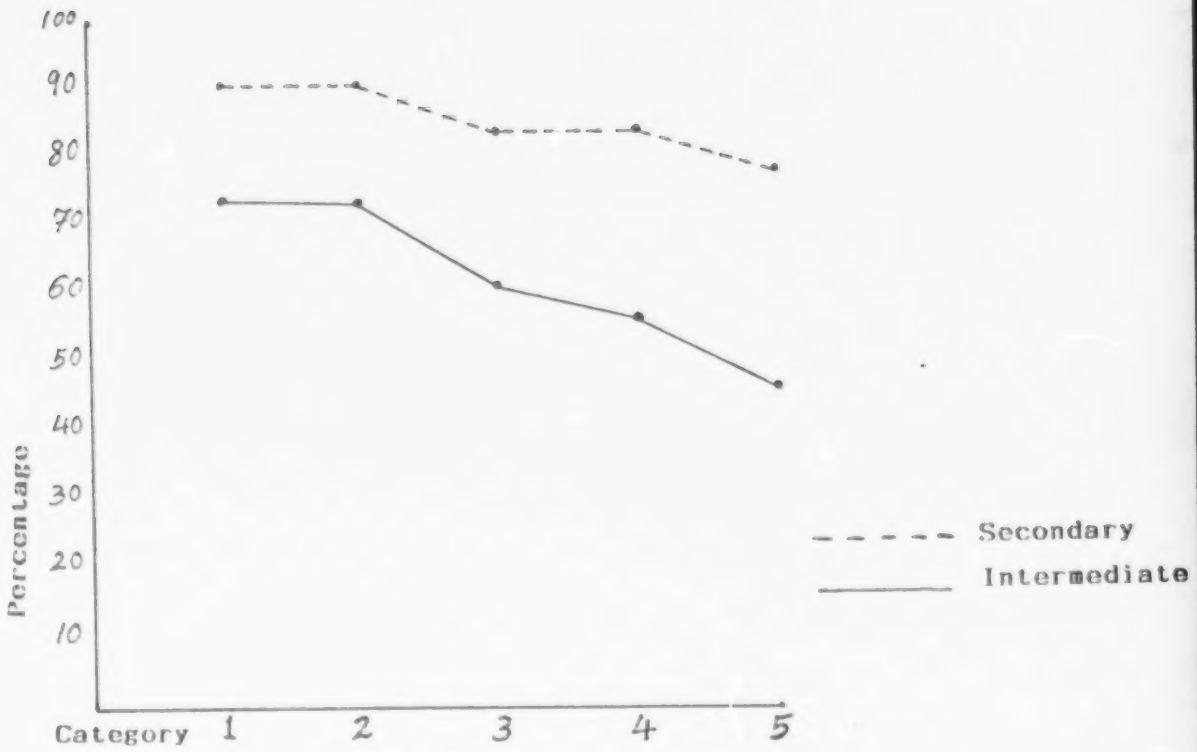

Chart 1. Percentages of Correct Spelling in the two Groups.

B. Phonetically Accurate Errors:

It has been found that the phonetically accurate errors made by first year secondary students were less than those made by first year intermediate students in each of the five categories as well as in the total phonetically accurate errors. Category 1 may be excluded on the basis that it has, by definition, only one possible orthographic representation and, consequently, does not allow any phonetically accurate errors.

However, the order of categories was the same in the two groups:

1 (lowest), 2, 3, 4, 5 (highest).

This may imply that the effect of the number of orthographic alternates on the phonetically accurate errors was similar in the two groups; the more orthographic alternates sounds have, the more phonetically-accurate errors students produce.

To conclude, it seems that although 1st year secondary students achieved improvement in spelling ability (as could be noticed from the less mistakes done), the two groups were similar with regard to the effect of the number of orthographic alternates on their spelling ability. Chart 2 compares these errors in the two groups.

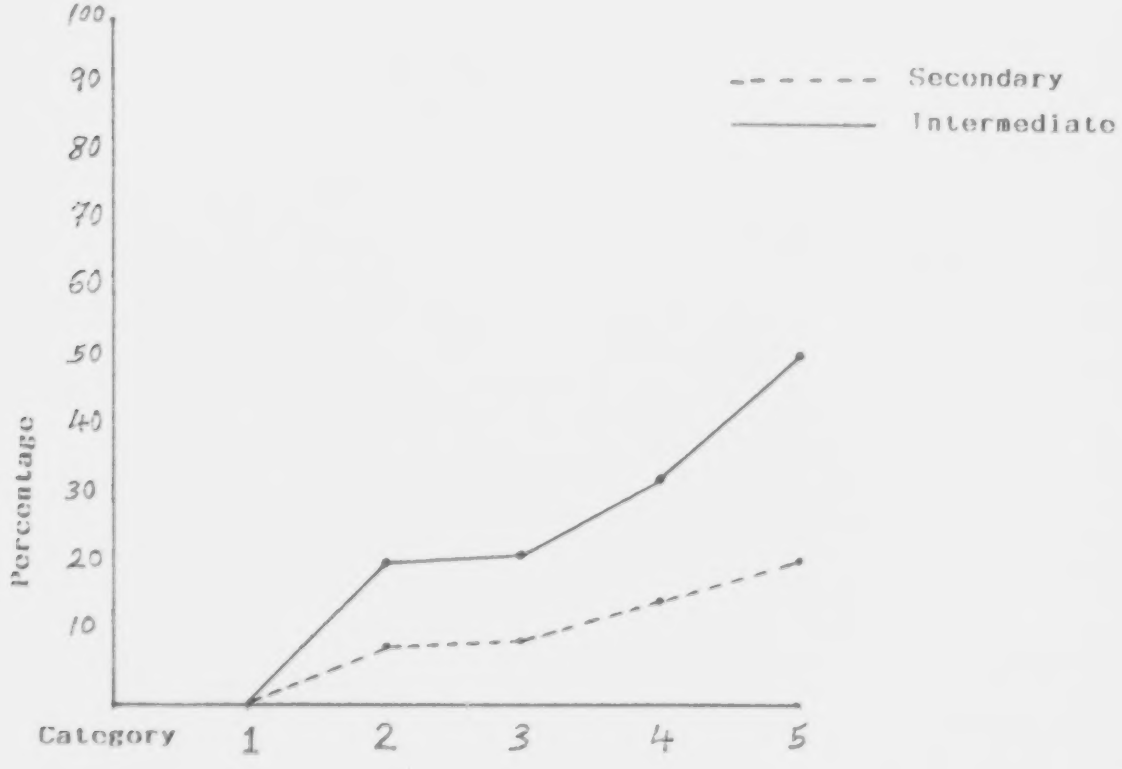

Chart 2. Percentages of Phonetically Accurate Errors in the Two Groups.

C. Phonetically Inaccurate Errors:

It has been found that the phonetically inaccurate errors made by 1st year secondary students were less than

those made by 1st year intermediate students in each of the five categories as well as in the total phonetically inaccurate errors. This implies that the sound-to-print rules are applied more correctly by secondary school students. This may be an indication of the progress achieved by secondary school students in their ability to apply the sound-to-print rules successfully in writing.

The order of categories showed differences between the two groups. However, both groups were similar in that the order of categories did not show consistent relationship between the number of alternates and the phonetically inaccurate errors. This finding supports the conclusion reached in the previous study (Badr, 1989) that the number of orthographic alternates may not be the determining factor behind students' phonetically inaccurate errors. Such errors may be the result of differences in the spelling and sound systems of English and Arabic. Chart 3 compares the phonetically inaccurate errors made by the two groups.

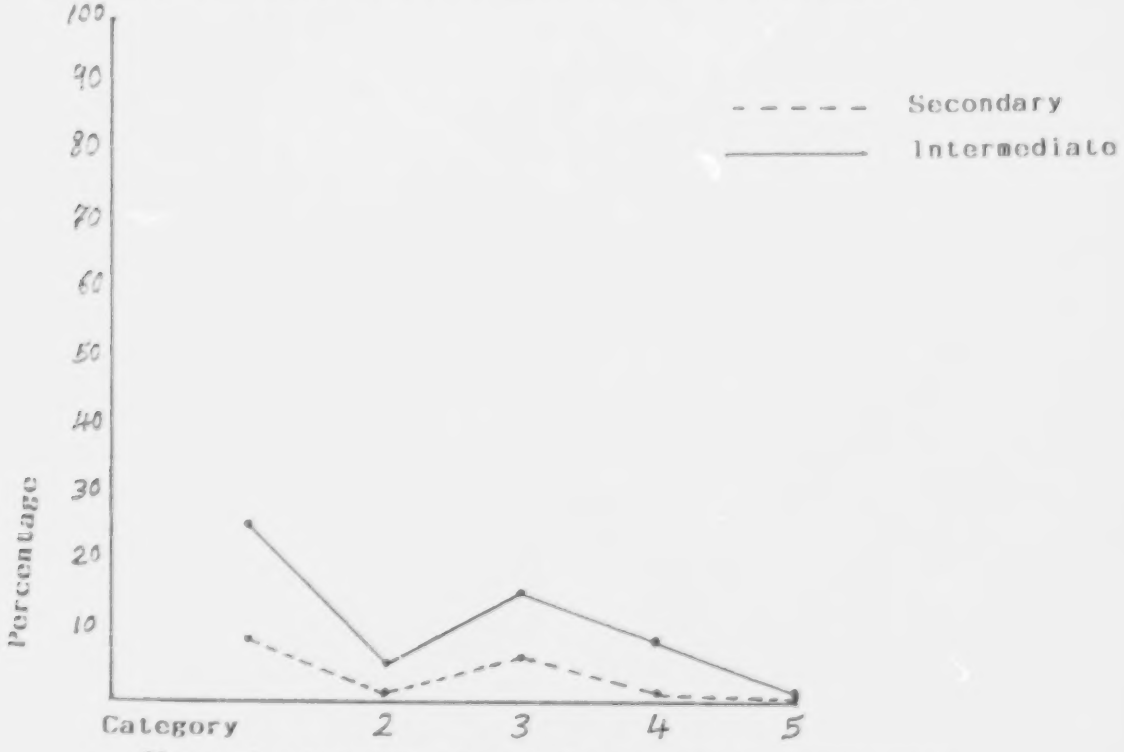

Chart 3. Percentages of Phonetically Inaccurate Errors in the Two Groups.

II. Comparing the Behaviour of the two Spelling Mechanisms in the Two Groups.

A. Sound-to-Print Mechanism:

With the aim of comparing the efficiency of the sound-to-print mechanism in the two groups, it was found that the mechanism of first year secondary students is developed with 6.7% (Table 2). This means that the correlation between graphemes and phonemes is more established in the mind of secondary school students than intermediate school students.

However, when the behaviour of the sound-to-print mechanism was investigated in the two groups with respect to the number of orthographic alternates, it was found that there was a similarity in that the order in the two groups did not show consistent relationship between the number of alternates and the phonetically accurate responses. Chart 4 compares the performance of the sound-to-print mechanism in the two groups (based on Table 3).

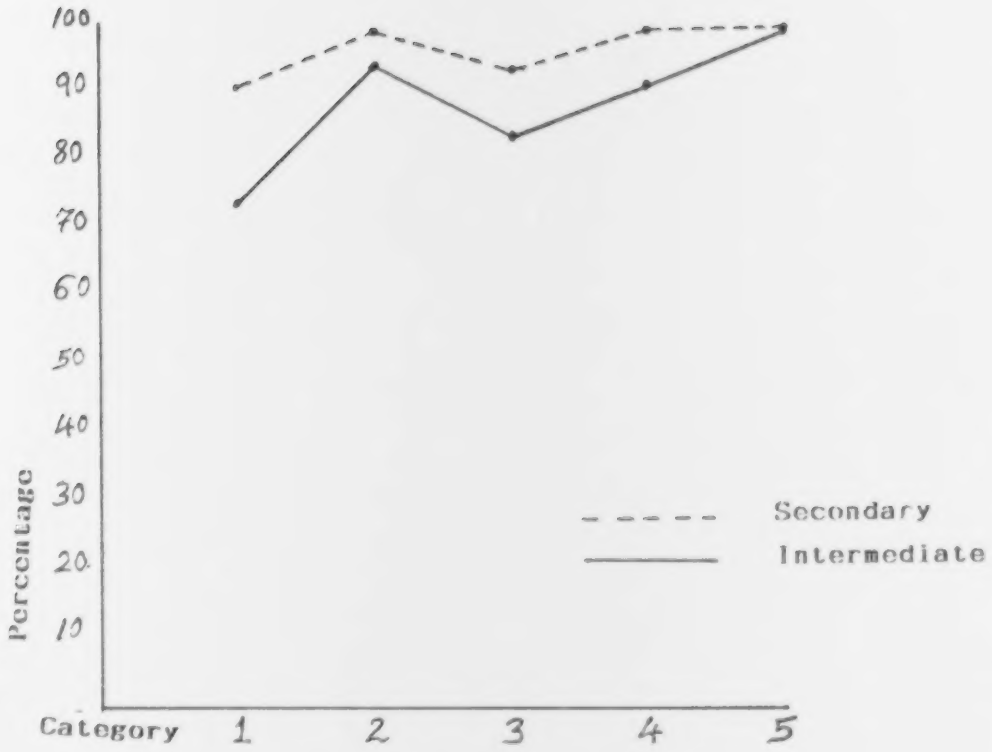

Chart 4. Performance of the Sound-to-Print Mechanism in the Two Groups.

B. Selection Mechanism:

To compare the efficiency of the selection mechanism in the two groups, it was found that the selection ability of the secondary school group was substantially improved over the intermediate school group. This was the result of the experience they acquired during their study.

However, the two groups were similar in the consistent negative relationship between the number of alternates and the selection mechanism. Consequently, the behaviour of the selection mechanism was similar but at a higher level. Chart 5 compares the performance of the selection mechanism in the two groups (based on Table 4).

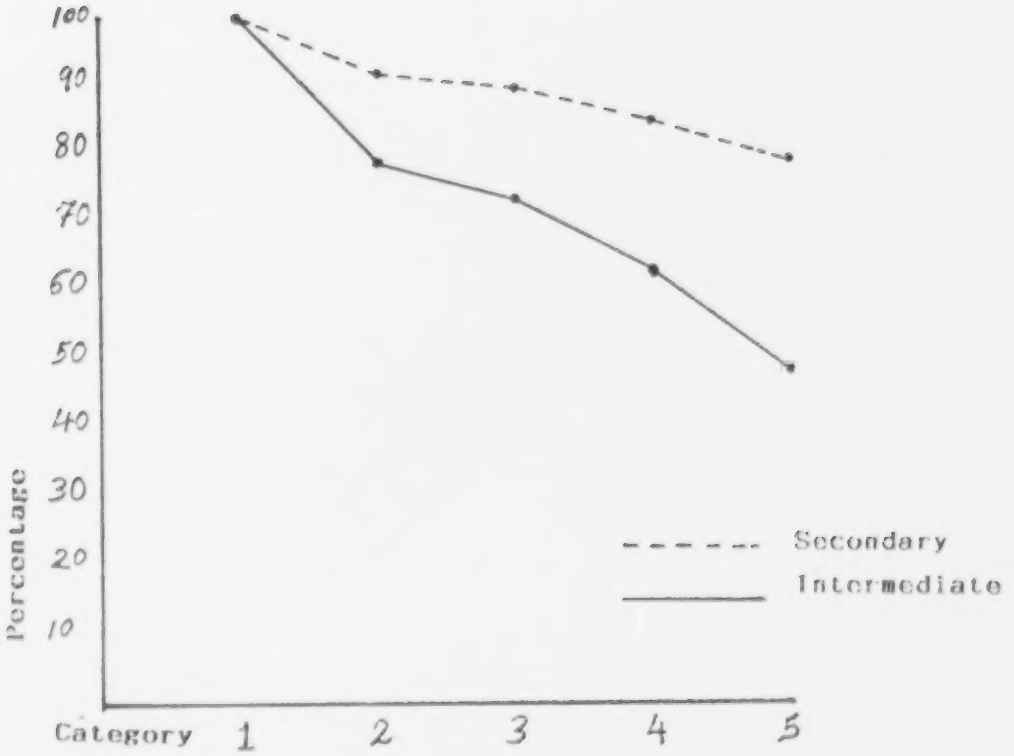

Chart 5. Performance of the Selection Mechanism in the Two Groups.

CONCLUSION

The two spelling mechanisms (sound-to-print and selection) were investigated to compare their behaviour in two different levels of language ability represented by two groups (intermediate first grade versus secondary first grade). It was found that the general spelling ability of secondary school students showed definite improvement over intermediate school students. Although the two mechanisms function more efficiently in the secondary school, the behaviour of these mechanisms seemed to be similar in the two groups. Further research is required to compare the behaviour of these spelling mechanisms at higher levels of

language ability and to compare the behaviour of these mechanisms in the native language and the foreign language.

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Appendix A

The Spelling Test

Students were required to give the English word for each of the following Arabic words:

(The target spelling items are underlined in the English words).

1. apples	تفاح	20. shop	دكان
2. teacher	مُعلّم	21. moustache	شارب (شنب)
3. letter	رسالة	22. sugar	السكّر
4. market	سوق	23. Egyptian	مصرى
5. mosque	مسجد	24. zero	صفر
6. doctor	طبيب	25. television	تليفزيون
7. black	أسود	26. measure	يقيس
8. stomach	المعدة	27. June	يونية (حزيران)
9. address	عنوان السكن	28. watch	ساعة يد
10. egg	بيضة	29. temperature	درجة الحرارة
11. green	أخضر	30. bridge	جسر (كوبرى)
12. five	خمسة	31. hammer	مطرقة (شاكوش)
13. a bag of rice	كيس أرز	32. sunny	مُشمس
14. coffee	قهوة (بن)	33. morning	الصباح
15. telephone	الهاتف	34. banknote	عملة ورقية
16. south	الجنوب	35. yellow	أصفر
17. father	الوالد (أب)	36. sorry	آسف
18. circle	دائرة	37. please	من فضلك
19. scissors	المقص		

Appendix B

Numbers of the Three Types of Students' Responses for each Orthographic Representation (1st Year Secondary)

Category 1. One Orthographic Representation

Phoneme	Orthog. Representation	Correct	Phonet. Accurate Errors	Phonet. Inaccurate Errors	Total
/b/	b (black)	30	--	13	43
/θ/	th (south)	38	--	3	41
/ð/	th (father)	43	--	3	46
/h/	h (hammer)	42	--	--	42
/ž/	s (measure)	23	--	--	23
		176	--	19	195

Category 2. Two Alternative Representations

/p/	p (please)	43	--	4	47
	pp (apples)	38	--	3	41
/t/	t (banknote)	39	--	--	39
	tt (letter)	37	9	--	46
/d/	d (doctor)	44	--	--	44
	dd (address)	36	7	--	43
/g/	g (green)	45	--	--	45
	gg (egg)	44	3	--	47
/l/	l (television)	48	--	--	48
	ll (yellow)	31	15	--	46
/r/	r (zero)	45	2	--	47
	rr (sorry)	25	21	--	46
/m/	m (temperature)	29	1	--	30
	mm (hammer)	35	7	--	42
/n/	n (green)	45	--	--	45
	nn (sunny)	36	7	--	43
/v/	v (five)	44	--	4	48
	f (of)	44	1	1	46
/ŋ/	ng (morning)	42	--	1	43
	nk (banknote)	40	--	--	40
		790	73	13	876

Category 3. Three Alternative Representations

Phoneme	Orthog. Representation	Correct	Phonet. Accurate Errors	Phonet. Inaccurate Errors	Total
/z/	z (zero)	44	3	--	47
	s (please)	44	3	--	47
	ss (scissors)	33	2	3	38
/f/	f (five)	44	--	4	48
	ff (coffee)	41	5	1	47
	ph (telephone)	36	3	8	47
/č/	ch (teacher)	22	16	8	46
	tch (watch)	32	5	6	43
	t (temperature)	21	6	4	31
/ǰ/	j (June)	30	1	--	31
	dg (bridge)	26	2	--	28
	g (Egyptian)	46	1	--	47
		419	47	34	500

Category 4. Four Alternative Representations

/s/	s (south)	38	1	--	39
	ss (address)	30	12	1	43
	c (circle)	30	9	--	39
	sc (scissors)	31	9	--	40
/š/	sh (shop)	39	5	--	44
	s (sugar)	41	4	2	47
	t (Egyptian)	39	5	1	45
	ch (moustache)	36	6	--	42
		284	51	4	339

Category 5. Five Alternative Representations

/k/	k (market)	43	5	--	48
	c (doctor)	42	2	--	44
	ck (black)	23	19	--	42
	ch (stomach)	28	10	--	38
	q (mosque)	32	9	2	43
		168	45	2	215

Appendix C

Numbers of the Three Types of Students' Responses for each Orthographic Representation (1st Year Intermediate School)

Category 1. One Orthographic Representation

Phoneme	Orthog. Representation	Correct	Phonet. Accurate Errors	Phonet. Inaccurate Errors	Total
/b/	b (black)	52	--	10	62
/θ/	th (south)	24	--	18	42
/ð/	th (father)	32	--	22	54
/h/	h (hammer)	52	--	--	52
/ž/	s (measure)	12	--	10	22
		172	--	60	232

Category 2. Two Alternative Representations

/p/	p (please)	38	--	25	63
	pp (apples)	21	6	17	44
/t/	t (banknote)	26	--	--	26
	tt (letter)	32	22	--	54
/d/	d (doctor)	65	--	7	72
	dd (address)	19	4	--	23
/g/	g (green)	64	--	3	67
	gg (egg)	54	13	--	67
/l/	l (television)	78	--	--	78
	ll (yellow)	19	37	--	56
/r/	r (zero)	80	1	--	81
	rr (sorry)	13	56	--	69
/m/	m (temperature)	34	--	--	34
	mm (hammer)	27	25	--	52
/n/	n (green)	66	--	--	66
	nn (sunny)	28	26	--	54
/v/	v (five)	41	40	--	81
	f (of)	67	1	8	76
/ŋ/	ng (morning)	50	1	3	54
	nk (banknote)	27	1	2	30
		849	233	65	1147

Category 3. Three Alternative Representations

Phoneme	Orthog. Representation	Correct	Phonet. Accurate Errors	Phonet. inaccurate Errors	Total
/z/	z (zero)	72	8	--	80
	s (please)	51	12	--	63
	ss (scissors)	17	20	11	48
/f/	f (five)	77	--	3	80
	ff (coffee)	46	20	6	72
	ph (telephone)	17	37	13	67
/č/	ch (teacher)	12	13	25	50
	tch (watch)	14	17	33	64
	t (temperature)	10	10	14	34
/ǰ/	j (June)	30	6	--	36
	dg (bridge)	11	5	2	18
	g (Egyptian)	45	--	--	45
		402	148	107	657

Category 4. Four Alternative Representations

/s/	s (south)	43	--	1	44
	ss (address)	7	15	1	23
	c (circle)	30	28	--	58
	sc (scissors)	15	34	--	49
/š/	sh (shop)	26	11	4	41
	s (sugar)	45	12	13	70
	t (Egyptian)	24	6	3	33
	ch (moustache)	14	15	13	42
		204	121	35	360

Category 5. Five Alternative Representations

/k/	k (market)	74	9	--	83
	c (doctor)	26	47	--	73
	ck (black)	14	47	1	62
	ch (stomach)	14	20	4	38
	q (mosque)	14	29	--	43
		142	152	5	299